SWACSM Abstract

Heart Rate Variability Threshold Evaluation During Arm and Leg Cycling

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ABSTRACT

Background: The Heart Rate Variability Threshold (HRVT) is a point of deflection in heart rate variability assessed during incremental exercise to exhaustion. This threshold is thought to represent a shift in the autonomic balance. **Purpose:** The purpose of this study was to evaluate (HRVT) during arm (AC) and leg cycling (LC). **Methods:** There were twenty-three participants (age: 23.3±4.7 years; height: 168.6±7.5 cm; weight 66.8±8.9 kg). Participants did two graded exercise tests, one for AC and one for LC on different days. They wore a heart rate monitor which recorded R-R intervals. The test performed was a graded exercise test to exhaustion (GXT) using a ramp protocol. The root mean square of successive differences between normal heartbeats (RMSSD) of the R-R intervals during the GXT was calculated using specialized software. A time-varying moving average (64 second window and 3 second shift) was used. A piecewise fitting function consisting of two linear functions was used to detect time and RMSSD at HRVT**.** The time (as percentage of the total time to exhaustion) at which HRVT occurred was also calculated. A paired t-test was run for the outcomes of interest. Mean and standard deviations were reported and an alpha value of $p<.05$ was used to assume significant differences. **Results:** Log transformation was performed on the RMSSD and percentage at HRVT**.** There was no significant difference in time at HRVT ($p=0.36$) between AC (4.2 ± .1.0 minutes) and LC (3.9 ± 1.6 minutes) or percentage at threshold ($p=0.85$) between AC (49.3 ± 11.9%) and LC (50.4 ± 20.1%). There was also no significant difference in RMSSD at HRVT ($p=0.93$) between arm (1.3 ± 0.36 ms) and leg cycling (1.3 ± 0.54 ms). **Conclusion:** Time, RMSSD, and percentage at HRVT were not different between exercise modes. Autonomic balance, as measured by heart rate variability threshold, does not seem to be influenced by exercise modality.